NCERT Solutions for Class 11 Biology Chapter 7

Structural Organisation in Animals Class 11

Chapter 7 Structural Organisation in Animals Exercise Solutions

Q1 :

Exercise : Solutions of Questions on Page Number : **122**

Answer the following:

(i) What is the function of nephridia?

(ii) How many types of nephridia are found in earthworm based on their location?

Answer :

(i) Nephridia are segmentally arranged excretory organs present in earthworms.

(ii) On the basis of their location, three types of nephridia are found in earthworms. They are:

(a) Septal nephridia: These are present on both sides of the inter-segmental septa behind the 15th segment. They open into the intestines.

(b) Integumentary nephridia: These lie attached to the body wall from the third segment to the last segment, which opens on the body surface.

(c) Pharyngeal nephridia: These are present as three paired tufts in fourth, fifth, and sixth segments.

Q2 :

Draw a labelled diagram of the reproductive organs of an earthworm.

Answer :

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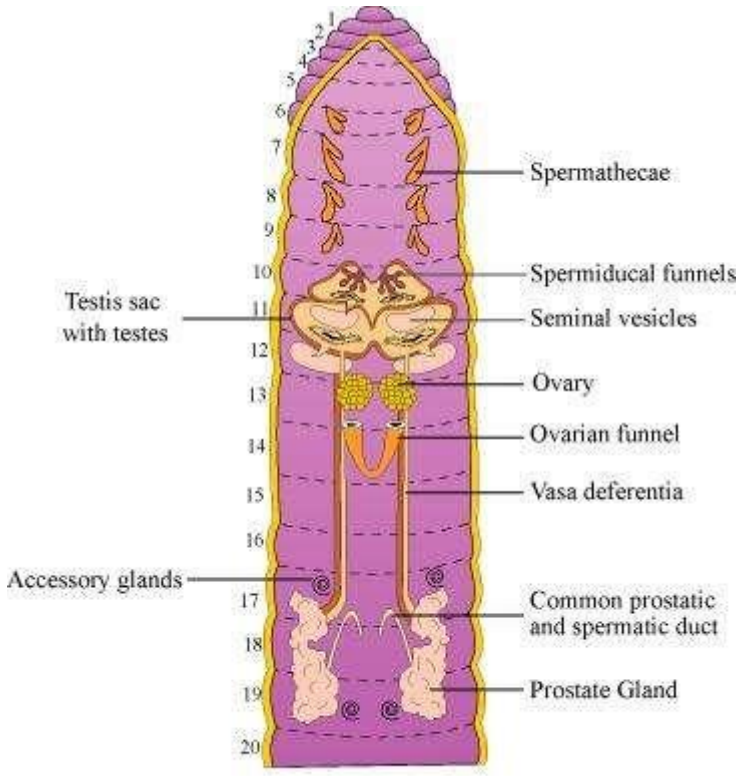
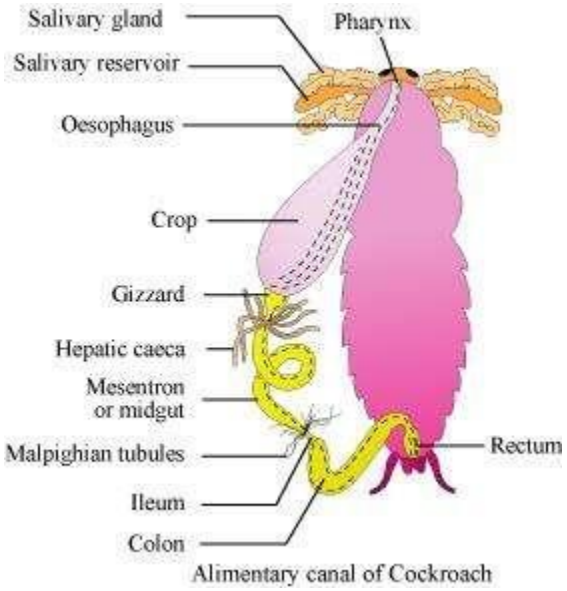


Reproductive system of Earthworm

Q3 :

Draw a labelled diagram of alimentary canal of a cockroach.

Answer :



Alimentary canal of Cockroach

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Q4 :

Distinguish between the following

(a) Prostomium and peristomium

(b) Septal nephridium and pharyngeal nephridium

Answer :

(a)

Prostomium	Peristomium
Prostomium is a small fleshy lobe, which overhangs the mouth of an earthworm. It helps the organism push into the soil and is sensory in function.	The first body segment in the earthworm is called the peristomium. It surrounds the mouth opening.

(b)

Septal nephridium	Pharyngeal nephridium
They are present on both sides of inter-segmental septa behind the 15th segment. They open into the intestines.	They are present as three paired tufts in the fourth, fifth, and sixth segments.

Q5 :

What are the cellular components of blood?

Answer :

Components of blood include erythrocytes (RBCs), leucocytes (WBCs), and thrombocytes (platelets). These components form 45% of blood. They are suspended in the remaining fluid portion, called plasma.

Mammalian erythrocytes are biconcave, coloured cells devoid of a nucleus. They help in transporting respiratory gases.

Leucocytes or white blood cells are nucleated cells. They can be divided into two types, granulocytes (neutrophils, eosinophils, and basophils) and agranulocytes (lymphocytes and monocytes). They help fight against various disease-causing germs entering the body.

Thrombocytes are cell fragments produced from megarkaryocytes of the bone. They play a major role during blood coagulation.

Q6 :

What are the following and where do you find them in animal body

(a) Chondriocytes

(b) Axons

(c) Ciliated epithelium

Answer :

Chondriocytes:

They are cells of cartilages, and are present in small cavities within the matrix secreted by them.

Axons:

They are long, slender projections of neurons that help in carrying nerve impulses from the neuron body. Axons aggregate in bundles which make up the nerves.

Ciliated epithelium:

It consists of simple columnar or cuboidal epithelium with cilia on their free surfaces. It is present on the inner surface of the oviducts and bronchioles. It helps in the movement of eggs or mucus in specific directions.

Q7 :

Describe various types of epithelial tissues with the help of labelled diagrams.

Answer :

Epithelial tissue lines the surface of a body and forms a protective covering. Epithelium cells are packed tightly together with little intercellular matrix. Epithelial tissue in the body is of two types.

(a) Simple epithelium: It consists of a single layer of cells where cells are in direct contact with the basement membrane. It is further sub-divided into the following types:

(i) Simple squamous epithelium: It consists of a single layer of flat cells with irregular boundaries. It is found in the walls of the blood vessels and in the lining of alveoli.

(ii) Simple cuboidal epithelium: It consists of a single layer of cube-like cells. It is present in regions where secretion and absorption of substances takes place such as the proximal convoluted tubule region of the nephron.

(iii) Simple columnar epithelium: It consists of a single layer of tall, slender cells with their nuclei present at the base of the cells. They may bear micro-villi on the free surfaces. Columnar epithelium forms the lining of the stomach and intestines, and is involved in the function of secretion and absorption.

(iv) Ciliated epithelium: It consists of columnar or cuboidal cells with cilia on their free surfaces. They are present in bronchioles and oviducts from where they direct mucus and eggs in specific directions.

(v) Glandular epithelium:It consists of columnar or cuboidal cells involved in the secretion of substances. Glands are of two types, unicellular glands (goblet cells of the alimentary canal) and multicellular glands (salivary glands). They can be classified as exocrine (ductless glands) and endocrine glands (duct glands) by the method through which they

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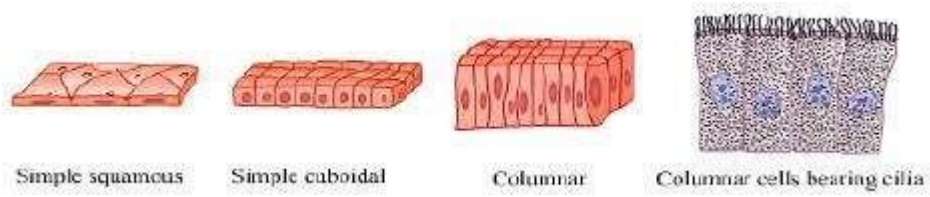
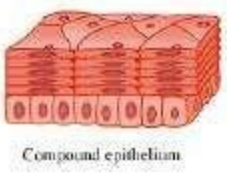


release enzymes.

(b)



Compound epithelium: It consists of many layers of cells. It is involved mainly in the function of providing protection and has a limited role in secretion and absorption.

Examples of compound epithelium include the dry surface of the skin or moist inner lining of the buccal cavity, pharynx, pancreatic ducts, and the inner lining of ducts of salivary glands.

Q8 :

Distinguish between

(a) Simple epithelium and compound epithelium.

(b) Cardiac muscle and striated muscle

(c) Dense regular and dense irregular connective tissues

(d) Adipose and blood tissue

(e) Simple gland and compound gland

Answer :

(a)

Simple epithelium	Compound epithelium

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1. It is composed of only one layer of cells. **2.** It is mainly involved in the function of absorption and secretion. **3.** It is present in the lining of the stomach, intestine.	**1.** It is composed of many layers of cells. **2.** It is mainly involved in the function of protection and has a limited role in absorption and secretion. **3.** It is present in the lining of the pharynx and buccal cavity.

(b)

Cardiac muscles	Striated muscles
1. They are involuntary in function. **2.** They are multi-nucleate and branched. **3.** They are found only in the heart.	**1.** They are voluntary in function. **2.** They are multi-nucleate and unbranched. **3.** They are found only in triceps, biceps, and limbs.

(c)

Dense regular connective tissues	Dense irregular connective tissues
1. In dense regular connective tissues, collagen fibres are present in rows between parallel boundless fibres. **2.** They are present in tendons and ligaments.	1. In dense irregular connective tissues, fibres are arranged irregularly. 2. They are present in the skin.

(d)

Adipose tissue	Blood tissue
1. It is composed of collagen fibres, elastin fibres, fibroblasts, macrophages, and adipociytes. **2.** It helps in the synthesis, storage, and metabolism of fats. **3.** It is present beneath the skin.	**1.** It is composed of RBCs, WBCs, platelets, and plasma. **2.** It helps in the transportation of food, wastes, gases, and hormones. **3.** It is present in the blood vessels.

(e)

Simple glands	Compound glands
1. They contain isolated glandular cells. **2.** They are unicellular. **3.** Examples include goblet cells of the alimentary canal.	**1.** They contain a cluster of secretory cells. **2.** They are multicellular. **3.** Examples include salivary glands.

Q9 :

Mark the odd one in each series:

(a) Areolar tissue; blood; neuron; tendon

(b) RBC; WBC; platelets; cartilage

(c) Exocrine; endocrine; salivary gland; ligament

(d) Maxilla; mandible; labrum; antennae

(e) Protonema; mesothorax; metathorax; coxa

Answer :

(a) Areolar tissue, blood, and tendons are examples of connective tissues. Neuron is an example of neural tissue.

(b) RBCs, WBCs, and platelets are the three most important components of blood. Cartilage is therefore, the odd one out.

(c) Exocrine, endocrine, and salivary glands are examples of simple glandular epithelium. Ligament is a connective tissue.

(d) Maxilla, mandible, and labrum are mouthparts of a cockroach. Antennae, on the other hand, are present in the head region of cockroaches.

(e) Protonema forms the developmental stage in the life cycle of a moss. Mesothorax, metathorax, and coxa are parts or segments present in the legs of a cockroach.

Q10 :

Match the terms in column I with those in column II:

Column I	Column II

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(a) Compound epithelium	(i) Alimentry canal
(b) Compound eye	(ii) Cockroach
(c) Septal nephridia	(iii) Skin
(d) Open circulatory system	(iv) Mosaic vision
(e) Typhlosole	(v) Earthworm
(f) Osteocytes	(vi) Phallomere
(g) Genitalia	(vii) Bone

Answer :

Column I	Column II
(a) Compound epithelium	(iii) Skin
(b) Compound eye	(iv) Mosaic vision
(c) Septal nephridia	(v) Earthworm
(d) Open circulatory system	(ii) Cockroach
(e) Typhlosole	(i) Alimentary canal
(f) Osteocytes	(vii) Bone
(g) Genitalia	(vi) Phallomere

Q11 :

Mention briefly about the circulatory system of earthworm

Answer :

Earthworms (*Pheretima*) have closed blood vascular systems, which consists of the heart, blood vessels, and capillaries. The heart pumps blood for circulating it in one direction. Blood is supplied by smaller blood cells to the gut nerve cord and the body wall. Blood glands are present in the 4^{th}, 5^{th}, and 6^{th} segments, which produce blood cells and haemoglobin dissolved in blood plasma. Blood cells in earthworms are phagocytic in nature.

Q12 :

Draw a neat diagram of digestive system of frog.

Answer :

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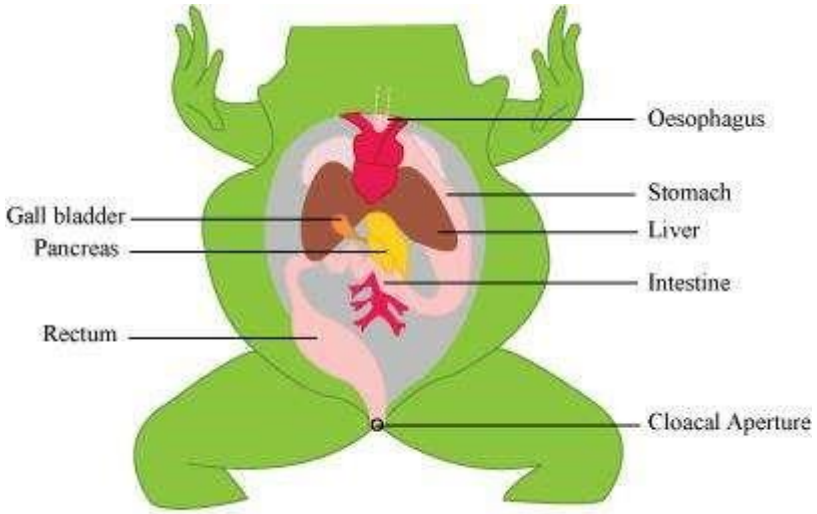

Digestive system of Frog

Q13 :

Mention the function of the following

(a) Ureters in frog

(b) Malpighian tubules

(c) Body wall in earthworm

Answer :

(a) Ureters in frogs: A ureter acts as a urinogenital duct, which carries sperms along with urine in male frogs.

(b) Malphigian tubules: Malphigian tubules are excretory organs in cockroaches.

(c) Body wall in earthworms: In earthworms, the body wall consists of muscle layers. It helps in movement and burrowing.

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